



# Forestry Department

Food and Agriculture Organization of the United Nations

## Forest Management Working Paper

*FORESTS AND FORESTRY IN*

*SMALL ISLAND DEVELOPING STATES*

by

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## FOREWORD

While the combined forest cover of Small Island Developing States (SIDS) may be insignificant in global terms (representing less than 1 percent of the forest area of the world), forests and trees on these islands are extremely important for the well-being of the inhabitants. For most of the larger islands, forests also contribute significantly to the national economy and to international trade in wood and non-wood forest products. In addition, forest resources on several islands are of global importance in terms of their role in the conservation of biological diversity, in particular endemic species and genetic variability.

Variations in size, location, population density and climatic, geological and topographic conditions make it difficult to generalise about SIDS. Nevertheless, these states share many characteristics which impose particular constraints, but also some which offer unique opportunities, for the sustainable management of their forest and tree resources.

This Working Paper provides an overview of forests and forestry in SIDS. It highlights that, as a group, SIDS are relatively well endowed with forests, but that the extent of forest cover varies greatly among island states. The many current and potential roles of forests and trees in SIDS are outlined as are major constraints and opportunities for the sustainable management of these resources. A medium-term outlook for the main island groups is presented. The prospects range from sustainable management of natural forests and plantation development in the Melanesian SIDS, to agroforestry and eco-tourism in Polynesia and Micronesia, forest conservation and restoration in East African SIDS and eco-tourism and safeguarding of freshwater resources in the Caribbean.

The extent to which SIDS will be able to overcome their common constraints and capitalise on existing and future opportunities for the sustainable management of their forest and tree resources depends, to a large extent, on the generation of awareness, political will and effective regional collaboration. Much progress has already been made on all three fronts in recent years and it is hoped that this overview will contribute to such efforts by providing additional information.

A slightly abbreviated version of this text was presented in the recent thematic issue on Small Island Developing States of the International Forestry Review, which was a joint effort of the Commonwealth Forestry Association and the FAO.

Rome, November 2002.

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**ABBREVIATIONS**

<b>AOSIS</b>	Alliance of Small Island States
<b>CANARI</b>	Caribbean Natural Resources Institute
<b>CARICOM</b>	Caribbean Community and Common Market
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>COI</b>	Commission de l'Océan Indien
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>ITTO</b>	International Tropical Timber Organization
<b>NWFP</b>	Non-wood Forest Products
<b>SIDS</b>	Small Island Developing States
<b>SPC</b>	Secretariat of the Pacific Community
<b>SPREP</b>	South Pacific Regional Environment Programme
<b>SPRIG</b>	South Pacific Regional Initiative on Forest Genetic Resources
<b>WMA</b>	Wildlife Management Areas (Papua New Guinea)

**ABSTRACT**

While the combined forest cover of Small Island Developing States (SIDS) is insignificant in global terms, forests and trees on these islands are extremely important for the well-being of the inhabitants. For most of the larger islands, forests also contribute significantly to the national economy and to international trade in wood and non-wood forest products. In addition, forest resources on several islands are of global importance in terms of their role in the conservation of biological diversity, in particular endemic species and genetic variability. As a group, SIDS are well endowed with forests but the extent of forest cover varies greatly among island states. Despite variations in size, location, population density and climatic, geological and topographic conditions, these states share many characteristics which impose particular constraints, but also some which offer unique opportunities, for the sustainable management of their forests and trees.



## INTRODUCTION

There is no internationally accepted definition of a Small Island Developing State (SIDS). However, small island states were given an international political identity with the establishment in 1991 of the Alliance of Small Island States (AOSIS) currently comprising 39 members (including four low-lying coastal states: Guinea-Bissau, Belize, Guyana and Suriname) and four dependent territories as observers. Two additional Small Island Developing States are members of the Food and Agriculture Organization of the United Nations (FAO), but not of AOSIS (Bahrain and Dominican Republic) taking the total number of SIDS to 41 for the purpose of this article. Eleven of these states have “least developed country”<sup>1</sup> status within the UN System (UNCTAD 2001).

Table 1 lists the 41 states which are members of FAO and/or of AOSIS as of September 2002.

**Table 1. Table of AOSIS/FAO members**

<p><b>Africa:</b></p> <ul style="list-style-type: none"> <li>• Cape Verde</li> <li>• Comoros</li> <li>• Guinea Bissau</li> <li>• Mauritius</li> <li>• São Tomé and Príncipe</li> <li>• Seychelles</li> </ul> <p><b>Europe:</b></p> <ul style="list-style-type: none"> <li>• Malta</li> </ul> <p><b>Oceania:</b></p> <ul style="list-style-type: none"> <li>• Cook Islands</li> <li>• Federated States of Micronesia</li> <li>• Fiji</li> <li>• Kiribati</li> <li>• Marshall Islands</li> <li>• Nauru</li> <li>• Niue</li> <li>• Palau</li> <li>• Papua New Guinea</li> <li>• Samoa</li> <li>• Solomon Islands</li> <li>• Tonga</li> <li>• Tuvalu*</li> <li>• Vanuatu</li> </ul>	<p><b>Asia:</b></p> <ul style="list-style-type: none"> <li>• Bahrain**</li> <li>• Cyprus</li> <li>• Maldives</li> <li>• Singapore*</li> </ul> <p><b>North and Central America:</b></p> <ul style="list-style-type: none"> <li>• Antigua and Barbuda</li> <li>• Bahamas</li> <li>• Barbados</li> <li>• Belize</li> <li>• Cuba</li> <li>• Dominica</li> <li>• Dominican Republic**</li> <li>• Grenada</li> <li>• Haiti</li> <li>• Jamaica</li> <li>• Saint Kitts and Nevis</li> <li>• Saint Lucia</li> <li>• Saint Vincent and Grenadine</li> <li>• Trinidad and Tobago</li> </ul> <p><b>South America:</b></p> <ul style="list-style-type: none"> <li>• Guyana</li> <li>• Suriname</li> </ul>
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\* = Not member of FAO, but member of AOSIS

\*\* = Not member of AOSIS, but member of FAO

<sup>1</sup> Cape Verde, Comoros, Guinea-Bissau, Haiti, Kiribati, Maldives, Samoa, Sao Tomè and Príncipe, Solomon Islands, Tuvalu and Vanuatu. The criteria for “least developed country” status include low income, weak human resources and a low level of economic diversification. Refer to <http://www.unctad.org/en/pub/lcdprofiles2001.en.htm> for details.



## FOREST RESOURCES

As a group, SIDS are well endowed with forests. According to the recently completed global forest resources assessment coordinated by FAO, forests were estimated to cover a total of 75 million ha or 63 percent of the combined land area of these 41 states in year 2000 (Table 2). However, due to the considerable variation in land area (ranging from 20 km<sup>2</sup> (Nauru) to more than 450 000 km<sup>2</sup> (Papua New Guinea)), population density and climatic, geological and topographic conditions, the extent of forest cover varies greatly among islands. Bahamas, Cook Islands, Palau, the Solomon Islands and two of the low-lying coastal states (Guyana and Suriname) are highly forested with a forest cover ranging from 76 to 96 percent of the total land area. Conversely, 11 of the 41 SIDS have a forest cover of less than 10 percent of the total land area (Bahrain, Barbados, Comoros, Haiti, Maldives, Malta, Marshall Islands, Mauritius, Nauru, Singapore and Tonga). Four of these (Bahrain, Malta, Marshall Islands and Nauru) reportedly have less than one percent forest cover. No data are available for Tuvalu.

Looking only at island states with a land area of less than 50 000 km<sup>2</sup> (i.e. excluding the low-lying coastal states, Papua New Guinea and Cuba) the combined forest cover is estimated at 38.4 percent of total land area in 2000, as compared to the world average of 29.6 percent.

Although the overall rate of deforestation appears to have slowed down in the last decade, the average annual deforestation rate is still high in many SIDS. Of the ten countries with the highest annual deforestation rates between 1990 and 2000 (3 percent or more per annum), four are SIDS (Haiti, St. Lucia, Federated States of Micronesia and Comoros). Only Burundi has a higher deforestation rate than Haiti and St. Lucia (FAO 2001a). The main causes of deforestation include conversion of forested land for agricultural use and for infrastructure development such as roads, ports, housing and tourism development.

Market forces outside the forestry sector can also have a noticeable positive effect on deforestation rates. The Caribbean countries are losing their preferential access to the European banana market and, as a result, the banana industry in the Windward Islands has been declining. This is expected to result in a decrease in the deforestation rate as the demand for additional land obtained through conversion of natural forests is reduced. Decline in sugar cane production, e.g. in St. Kitts and Nevis, has also led to natural expansion of forests which results in a decrease in net deforestation rate (FAO 2001b).

Encouragingly, Bahrain, Cape Verde, Cuba, Cyprus, Grenada and Vanuatu all registered an increase in forest cover from 1990 to 2000, mainly as a result of concerted afforestation efforts<sup>2</sup>.

For further details on forest cover and forest cover changes, refer to Table 2.

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<sup>2</sup> The total forest area in Cape Verde is reported to have more than doubled in size, from 35 000 ha to 85 000 ha, equivalent to an annual increase of 9.3 percent. And in Bahrain, 400 ha of plantations established in recent years comprise the only area classified as forest. The increase in Grenada is mainly through an expansion of natural forests.

Table 2. Forest cover 2000 and changes in forest cover 1990-2000 for Small Island Developing States

Country/Area	Land Area	Total forest 2000		Total forest 1990	Forest cover change 1990-2000		
		Area	Percentage of land area	Area	Total change 1990-2000	Annual change 1990-2000	
		000 ha	000 ha	%	000 ha	000 ha	000 ha
Cape Verde	403	85	21.1	35	50	5	9.3
Comoros	186	8	4.3	12	-4	n.s.	-4.3
Guinea Bissau	3,612	2,187	60.5	2,403	-216	-22	-0.9
Mauritius	202	16	7.9	17	-1	n.s.	-0.6
São Tomé and Príncipe	95	27	28.3	27	n.s.	n.s.	n.s.
Seychelles	45	30	66.7	30	n.s.	n.s.	n.s.
<b>Total African SIDS</b>	<b>4,543</b>	<b>2,353</b>	<b>51.8</b>	<b>2,524</b>	<b>-171</b>	<b>-17</b>	<b>-0.70</b>
Bahrain	69	n.s.	n.s.	n.s.	n.s.	n.s.	14.9
Cyprus	925	172	18.6	119	53	5	3.7
Maldives	30	1	3.3	1	n.s.	n.s.	n.s.
Singapore*	61	2	3.3	2	n.s.	n.s.	n.s.
<b>Total Asian SIDS</b>	<b>1,085</b>	<b>175</b>	<b>16.1</b>	<b>122</b>	<b>53</b>	<b>5</b>	<b>3.67</b>
Cook Islands	23	22	95.7	22	n.s.	n.s.	n.s.
Fiji	1,827	815	44.6	832	-17	-2	-0.2
Kiribati	73	28	38.4	28	n.s.	n.s.	n.s.
Marshall Islands	18	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Micronesia, Fed. States	69	15	21.7	24	-9	-1	-4.5
Nauru	2	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Niue	26	6	23.1	6	n.s.	n.s.	n.s.
Palau	46	35	76.1	35	n.s.	n.s.	n.s.
Papua New Guinea	45,239	30,601	67.6	31,730	-1,129	-113	-0.4
Samoa	282	105	37.2	130	-25	-3	-2.1
Solomon Islands	2,856	2,536	88.8	2,580	-44	-4	-0.2
Tonga	73	4	5.5	4	n.s.	n.s.	n.s.
Tuvalu*	3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Vanuatu	1,218	447	36.7	441	6	1	0.1
<b>Total Oceanian SIDS</b>	<b>51,755</b>	<b>34,614</b>	<b>66.9</b>	<b>35,832</b>	<b>-1,218</b>	<b>-122</b>	<b>-0.35</b>
Malta	32	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
<b>Total European SIDS</b>	<b>32</b>	<b>n.s.</b>	<b>n.s.</b>	<b>n.s.</b>	<b>n.s.</b>	<b>n.s.</b>	<b>n.s.</b>
Antigua and Barbuda	44	9	20.5	9	n.s.	n.s.	n.s.
Bahamas	1,001	842	84.1	842	n.s.	n.s.	n.s.
Barbados	43	2	4.7	2	n.s.	n.s.	n.s.
Belize	2,280	1,348	59.1	1,704	-356	-36	-2.3
Cuba	10,982	2,348	21.4	2,071	277	28	1.3
Dominica	75	46	61.3	50	-4	0	-0.7
Dominican Republic	4,838	1,376	28.4	1,376	n.s.	n.s.	n.s.
Grenada	34	5	14.7	5	n.s.	n.s.	0.9
Haiti	2,756	88	3.2	158	-70	-7	-5.7
Jamaica	1,083	325	30.0	379	-54	-5	-1.5
Saint Kitts and Nevis	36	4	11.1	4	n.s.	n.s.	-0.6
Saint Lucia	61	9	14.8	14	-5	-1	-4.9
Saint Vincent and Grenadine	39	6	15.4	7	-1	n.s.	-1.4
Trinidad and Tobago	513	259	50.5	281	-22	-2	-0.8
<b>Total North and Central American SIDS</b>	<b>23,785</b>	<b>6,667</b>	<b>28.0</b>	<b>6,902</b>	<b>-235</b>	<b>-24</b>	<b>-0.35</b>
Guyana	21,498	16,879	78.5	17,365	-486	-49	-0.3
Suriname	15,600	14,113	90.5	14,113	n.s.	n.s.	n.s.
<b>Total South American SIDS</b>	<b>37,098</b>	<b>30,992</b>	<b>83.5</b>	<b>31,478</b>	<b>-486</b>	<b>-49</b>	<b>-0.16</b>
<b>GRAND TOTAL FOR SIDS</b>	<b>118,298</b>	<b>74,801</b>	<b>63.2</b>	<b>76,858</b>	<b>-2,057</b>	<b>-206</b>	<b>-0.27</b>
<b>GRAND TOTAL ISLAND STATES &lt; 50000 KM<sup>2</sup></b>	<b>19,087</b>	<b>7,325</b>	<b>38.4</b>	<b>7,472</b>	<b>-147</b>	<b>-15</b>	<b>-0.20</b>
<b>GRAND TOTAL FOR WORLD</b>	<b>13,063,900</b>	<b>3,869,455</b>	<b>29.6</b>	<b>3,963,429</b>	<b>-93,974</b>	<b>-9,397</b>	<b>-0.24</b>

The regional groups used in this table represent FAO's standardized regional breakdown of the world according to geographical criteria. Forest is defined as land with tree crown cover of more than 10 percent and area of more than 0.5 ha whose primary use is forestry. The trees should be able to reach a minimum height of 5 metres at maturity *in situ*. Numbers may not tally due to rounding. n.s. = not significant; indicating a very small value; n.a. = not available; \* = not FAO Member State. Figures extracted from FAO 2001a

In addition to deforestation, forest degradation<sup>3</sup> also takes place in some SIDS. Samoa, the Solomon Islands and Tonga are among countries with high rates of forest degradation due to overexploitation of merchantable timber resources (FAO, 1997). Forest degradation due to natural causes (e.g. cyclones and forest fires) is also common in some SIDS.

Trees outside forests (TOFs), such as on agricultural land, often play a very important role for local livelihoods in SIDS with limited forest cover. Although unquantified and undervalued, the products yielded by trees outside forests are, nevertheless, often of very significant value. For instance, many small island nations have abundant coconut tree resources, which serve as sources of timber, coconuts, copra and oil for local populations.

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<sup>3</sup> “Changes within the forest which negatively affect the structure or function of the stand or site, and thereby lower the capacity to supply products and/or services” (FAO 2001a)

## THE ROLE OF FORESTS AND TREES IN SMALL ISLAND DEVELOPING STATES

While the forest cover on the 41 island states considered here is insignificant in global terms (representing less than 1 percent of the forest area of the world), forests and trees on these islands are extremely important for the well-being of the inhabitants. In addition, forest resources on several islands have global significance in terms of conservation of biological diversity. For most of the larger islands, forests also contribute significantly to the national economy. Some of the major roles of forests and trees in small island developing states are outlined below.

### **Production and trade of wood and non-wood forest products**

Fifteen SIDS list timber or hardwood forests as one of their main natural resources<sup>4</sup>. Of these, Fiji, Guyana, Papua New Guinea, Samoa, Solomon Islands, Suriname and Vanuatu report wood processing as one of their main industries.

Table 3 lists the latest available figures for production, trade and consumption of forest products for SIDS. With regard to industrial roundwood, Papua New Guinea is, by far, the largest SIDS producer and exporter and is currently the world's third largest exporter of tropical hardwood logs with the annual trade valued at more than US\$ 220 million (FAO 2000a). However, compared to their actual land or forest area, countries such as Fiji, Samoa and the Solomon Islands have a higher rate of production of industrial roundwood than Papua New Guinea and the low-lying coastal states. The Solomon Islands was thus the world's fifth largest exporter of tropical hardwood logs in 1997, when forestry comprised more than 50 percent of export revenues. Although the annual volume of hardwood exported as logs had been reduced to almost half of the 1996 volume by 2000, the Solomon Islands was still among the top ten exporting countries (FAO 200a). Sandalwood has been a notable export from Vanuatu for more than a century.

Conversely, many of the smaller states in Oceania and the Indian Ocean and all the Caribbean states except Cuba are dependent on imports to meet all or the major part of their needs for sawnwood and wood-based panels. All SIDS are dependent on imported paper and paperboard. Countries which rely on imports for fuelwood and charcoal and/or industrial roundwood include Barbados, Bahamas, Dominican Republic, St. Lucia, Malta, Mauritius, Trinidad and Tobago and Tonga. Despite the fact that Caribbean states depend on imports of sawnwood, it has been suggested that, St. Vincent and the Grenadines, for example, could produce enough to meet national demand for sawn timber with only 1500 ha of forest plantations (FAO 1998). The current area of plantation in this country is estimated at 250 ha (FAO 2001a).

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<sup>4</sup> Bahamas, Belize, Cuba, Cyprus, Dominica, Fiji, Grenada, Guinea Bissau, Guyana, Papua New Guinea, Samoa, Solomon Islands, St. Lucia, Suriname and Vanuatu. Source: AOSIS.

**Table 3. Production, trade and consumption of forest products in Small Island Developing States Year 2000**

Country	Fuelwood and Charcoal (1000 m <sup>3</sup> )				Industrial Roundwood (1000 m <sup>3</sup> )				Sawnwood (1000 m <sup>3</sup> )				Wood-based panels (1000 m <sup>3</sup> )				Pulp for paper (1000 tonnes)				Paper and Paperboard (1000 tonnes)							
	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption				
<b>AFRICA:</b>																												
Cape Verde	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	2	0	2	n.a.	2	0	2	n.a.	n.a.	n.a.	0	n.a.	0	0	0	n.a.	0	0	0
Comoros	n.a.	0	n.a.	0	9	0	0	9	n.a.	1	0	1	n.a.	0	0	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0
Guinea-Bissau	422	n.a.	0	422	170	0	7	163	16	0	0	15	n.a.	0	0	0	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0
Mauritius	12	0	0	12	13	16	0	29	5	40	0	45	0	36	0	36	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	43	1	42
São Tomé and Príncipe	n.a.	0	n.a.	0	9	0	0	9	5	0	0	5	n.a.	0	0	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	1	0	0
Seychelles	n.a.	n.a.	n.a.	0	n.a.	0	0	0	n.a.	0	0	0	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0
<b>ASIA:</b>																												
Bahrain	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	20	0	20	n.a.	5	n.a.	5	n.a.	5	n.a.	5	n.a.	19	0	19
Cyprus	5	0	0	n.a.	15	2	0	17	9	67	1	74	12	81	0	93	0	2	0	2	0	55	1	54				
Maldives	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	4	0	4	n.a.	n.a.	n.a.	0	n.a.	1	0	1				
Singapore	n.a.	1	0	1	n.a.	16	7	9	25	354	172	206	355	434	169	620	n.a.	73	144	0	87	893	213	768				
<b>OCEANIA:</b>																												
Cook Islands	n.a.	n.a.	n.a.	0	5	0	4	1	n.a.	2	n.a.	2	n.a.	1	0	1	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Fiji	37	n.a.	n.a.	37	449	0	1	448	72	0	17	55	12	3	7	8	n.a.	0	n.a.	0	n.a.	18	0	18				
Kiribati	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	2	n.a.	2	n.a.	0	n.a.	0	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0				
Marshall Islands	n.a.	n.a.	n.a.	0	n.a.	n.a.	n.a.	0	n.a.	6	n.a.	6	n.a.	3	n.a.	3	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0				
Micronesia, Fed. States	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	7	n.a.	7	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0				
Nauru	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	0	0	0	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Niue	n.a.	n.a.	n.a.	0	n.a.	n.a.	n.a.	0	n.a.	0	0	0	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	0	0	0				
Palau	n.a.	n.a.	n.a.	0	n.a.	1	n.a.	1	n.a.	3	n.a.	3	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Papua New Guinea	5533	0	n.a.	5533	3064	0	1902	1163	218	0	20	198	15	2	12	5	n.a.	n.a.	n.a.	0	n.a.	18	0	18				
Samoa	70	0	n.a.	70	61	0	6	55	21	8	1	27	0	2	n.a.	2	n.a.	0	0	0	n.a.	0	0	0				
Solomon Islands	138	n.a.	0	138	734	n.a.	424	310	12	0	4	8	0	0	n.a.	0	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Tonga	n.a.	2	n.a.	2	2	0	0	2	2	7	0	9	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Tuvalu	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	1	n.a.	1	n.a.	0	n.a.	0	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Vanuatu	91	n.a.	1	90	40	0	0	40	18	1	10	9	n.a.	2	0	2	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
<b>EUROPE:</b>																												
Malta	0	0	0	0	0	4	0	4	0	22	0	22	0	26	0	26	0	0	0	0	0	36	0	36				
<b>N C AMERICA:</b>																												
Antigua and Barbuda	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	0	0	0	n.a.	4	0	4	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Bahamas	n.a.	n.a.	n.a.	0	17	17	0	34	1	78	2	77	n.a.	17	0	17	n.a.	0	n.a.	0	n.a.	8	0	8				
Barbados	n.a.	1	n.a.	1	5	2	0	7	n.a.	63	0	63	n.a.	15	0	15	n.a.	2	0	2	n.a.	11	0	11				
Belize	126	n.a.	0	126	62	1	0	62	35	15	8	42	n.a.	19	3	16	n.a.	2	2	0	n.a.	2	0	2				
Cuba	2854	n.a.	n.a.	2854	406	0	0	406	146	11	0	157	149	10	1	158	52	2	n.a.	54	57	35	0	92				
Dominica	n.a.	0	0	0	n.a.	0	0	0	n.a.	7	0	7	n.a.	6	0	6	n.a.	0	0	0	n.a.	7	1	6				
Dominican Republic	556	0	n.a.	556	6	9	0	16	0	289	0	289	n.a.	44	0	44	n.a.	0	n.a.	0	130	181	0	311				
Grenada	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0	n.a.	10	n.a.	10	n.a.	4	n.a.	4	n.a.	n.a.	n.a.	0	n.a.	0	0	0				
Haiti	1964	n.a.	n.a.	1964	239	1	0	240	14	22	0	36	n.a.	4	n.a.	4	n.a.	0	n.a.	0	n.a.	6	0	6				
Jamaica	599	0	n.a.	599	282	1	0	283	66	221	0	287	0	51	n.a.	51	n.a.	0	n.a.	0	0	78	0	78				
Saint Kitts and Nevis	n.a.	n.a.	n.a.	0	n.a.	1	n.a.	1	n.a.	5	0	5	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	0	n.a.	0	n.a.	0				
Saint Lucia	n.a.	0	n.a.	0	n.a.	7	n.a.	7	n.a.	15	n.a.	15	n.a.	7	n.a.	7	n.a.	0	n.a.	0	n.a.	10	0	10				
Saint Vincent and Grenadine	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	21	0	21	n.a.	16	0	16	n.a.	n.a.	n.a.	0	n.a.	5	0	5				
Trinidad and Tobago	37	0	n.a.	37	80	10	0	90	37	30	1	66	n.a.	5	0	5	0	6	0	6	n.a.	70	1	69				
<b>SOUTH AMERICA:</b>																												
Guyana	880	n.a.	0	880	308	0	54	254	29	0	42	0	92	0	87	5	n.a.	0	n.a.	0	n.a.	6	0	6				
Suriname	43	0	n.a.	43	184	0	10	174	78	0	7	71	4	0	1	3	n.a.	0	n.a.	0	n.a.	2	0	2				

The regional groups used in this table represent FAO's standardized regional breakdown of the world according to geographical criteria. Figures are extracted from FAO 2000.

Commercially important non-wood forest products (NWFPs) include kava (*Piper methysticum*), noni (*Morinda citrifolia*) juice, rattan (*Calamus* spp.), oil from sandalwood (*Santalum* spp.) and canarium (*Canarium indicum*) nuts in the Pacific; ornamental plants, such as *Trochetia boutoniana*, in Mauritius and cinnamon in the Seychelles. Nuts of the endemic Coco-de-mer brings more revenue to the Government of the Seychelles than wood production (Vielle 2001).

In the Caribbean, the most important NWFPs are medicinal and aromatic plants (including candlewood (*Amyris balsamifera*), citronella (*Cymbopogon citratus*) rosewood (*Aniba rosaeodora*) and sassafras (*Ocotea pretiosa*). Grenada is the world's second largest producer of essential oils derived from the seeds of the nutmeg tree, *Myristica fragrans*. Some 25 percent of the world production come from Grenada contributing around 40 percent of the country's export revenue despite a recent decline due to decreased demand and competition from other countries. The heart of the manicole palm (*Euterpe oleracea*) is an important export products in Guyana and the principal source of income for Amerindian communities in the coastal wetlands. Annual production rose to more than 1.5 million tonnes in 1995 with export revenues of US\$ 2 million. Edible forest fruits such as maripa (*Astrocaryum maripa*) and awara (*Astrocaryum segregatum*) are exported from Suriname. (FAO 2001a). Trade in wild animals is also important for some SIDS, with Guyana being the fifth largest exporter of wild birds in the world (Forestry Commission 2000). Mauritius is exporting about 7 000 monkeys annually. The *Macaca fascicularis* was introduced to Mauritius in the 16th century and has become a threat to the native fauna and flora. Feral monkeys are captured and bred in captivity for export. For every animal exported US\$ 50 are contributed to the Wildlife Conservation Fund to be utilised for the conservation of indigenous biodiversity (Paupiah 2001).

### **The role of trees in improving food security**

Forests and trees contribute directly to food security through the provision of edible forest products such as fruits, nuts and berries, leaves, shoots, roots, mushrooms, animals (mammals, rodents, fish, birds and insects) and animal products (e.g. honey, eggs and bird's nests).

A report by FAO on the uses of trees and forests in the Pacific noted: "Food from trees are of immense value, whether as staples, supplementary foods, occasional snacks or famine foods. The nutritional importance of dominant staple tree crops such as coconut, breadfruit and bananas and plantains, fruit and nut trees, spices and sauces, and wildfoods is critical to the nutritional wellbeing of Pacific island peoples." (FAO 1995).

In the Caribbean, important edible products include fruits such as maripa (*Astrocaryum maripa*) and awara (*Astrocaryum segregatum*) in Suriname and balata (*Manilkara bidentata*), hog plum (*Spondias mombin*) and serrette (*Brysonima coriacea*) in Trinidad and Tobago (FAO, 2001a). Beekeeping is an important activity in many countries including the Dominican Republic and Cuba and dependence on wildlife species for protein is high in SIDS with dense forest cover. Edible forest plants also provide essential vitamins and trace elements to local populations, which may be of particular importance to children and women.

For 75 to 90 percent of the people in developing countries, natural products represent the only source of medicine. It is, for example, estimated that there are 250 to 500 plants with curative properties in the Seychelles and the Department of Industry is currently conducting a survey and analysis of these aimed at establishing a national data bank with information on species distribution, chemical and pharmaceutical properties and ethno-botanical knowledge (Vielle 2001).

Many of the foods consumed today originated as wild crops in forests including breadfruit, bananas, plantains, cocoa, cola nut, coffee, mango, pawpaw, guava and avocado. Such major staples as yams and cowpeas probably evolved on the forest margins and wild rice originated in swampy areas of the forest. Oil palms and the shea butter tree are other important food producing species originating in forests and woodlands. (Ball, Braatz and Chandrasekharan 1995) Genetic improvement of these crops has much to gain from existing wild species, which may possess valuable traits that can be incorporated into their cultivated relatives to make them hardier and more disease resistant. Forests and trees also provide browse and fodder for domestic animals – not least in periods of drought.

Most staple foods are unpalatable if not cooked. Forests and trees provide the necessary fuelwood and charcoal for local and national needs in many SIDS. Detailed national level information on the consumption of woodfuels is missing from 24 of the 41 SIDS. However, available information shows that, in 1995, inhabitants of Samoa, Trinidad and Tobago, Guinea Bissau, Papua New Guinea and Haiti relied on woodfuels to meet from 30 to 98 percent of their total energy needs - much of this being used for cooking purposes (FAO 2002). Fuelwood is also an essential resource for food preservation, in particular for smoking and drying (e.g. fish). Wood and non-wood fibre resources are furthermore often used for production of agricultural implements, food containers, boats and canoes, hunting and fishing gear. Live fencing and wooden fences play a very important role in supporting food security by keeping out unwanted animals.

In addition to the above direct benefits, forests and trees have important environmental and social functions, which indirectly contribute to food security. Coral based soils, which are common in many SIDS, are among the least fertile in the world. Increased organic matter provided by trees improves soil fertility by increasing the water retention capacity, reducing soil pH, providing nutrients, reducing the leaching effects of wind and rains and reducing run-off and evaporation. These soil improvement roles of trees are of great importance to the success of agriculture and plant growth in atolls and other coral-based islands.

Forests are home to millions of people worldwide and although the number of forest dwellers may not be large in small islands, many people depend on nearby forests for their livelihood. Income and employment provided by forestry activities increase the possibility of rural communities to purchase food and other basic necessities. The specialised economies of many small island countries depend also, in a wider sense, on the protective, ecological, amenity and aesthetic functions of their forests and trees as discussed below.

**Protective functions of trees and forests**

Because of their small land area, most SIDS are characterised by comparatively short distances between uplands and coastal areas. Under such conditions, forest ecosystems are critical as regulators of water supply (for consumption, irrigation and industrial uses and for generation of energy) in terms of both quantity and quality.

The provision of potable water is, perhaps, the most important function of the forest in the Caribbean islands. In the Windward Islands all the water for household and industrial purposes is surface water taken from streams in the forest. Such water does not require complicated treatment nor does it require energy to transport it to the consumer, as it is gravity fed directly into the households. This service is highly appreciated by the inhabitants but, as it is taken for granted, there is little inclination to include this benefit in national accounting or to compensate the forest service for safeguarding the provision of water.

Forest cover, by preventing erosion, is also important for the maintenance of soil fertility and the health of the marine environment. A problem of considerable concern in many islands is the high sediment load in rivers which, when deposited in the sea, smothers coral reefs and other coastal environments such as sea grass beds.

Another important protective role for forests in small islands, in particular in the tropics, is as a means of coastal protection. Tropical storms, hurricane and cyclones combined with high rainfall levels and storm surges are common occurrences in many islands. Forests act as buffers against the impacts of these and protect agricultural land from the effects of salt spray.

**Conservation of biological diversity**

Due to their size and physical isolation from other land masses, small islands generally do not possess a high degree of biological diversity in terms of number of different plant and animal species. However, the percentage of endemic species is often very high. Examples include Dominican Republic, Fiji, Haiti, Jamaica and Mauritius, in which more than 30 percent of the higher plant species are endemic. With regard to birds, Fiji and the Solomon Islands have 24 and 20 percent endemism respectively. Half of the mammal species of Mauritius, one third of those in the Solomon Islands and a quarter of those in Fiji are found nowhere else. (WRI/UNEP/UNDP/World Bank 1996). Many of these endemic plant and animal species are found in forests.

The conservation of biological diversity - both directly in the forest and indirectly by protecting associated ecosystems such as coral reefs - is, therefore, one of the most important environmental roles played by forests in small islands, also from a global perspective. In recognition of their important heritage, most Small Island Developing States are signatory to the Convention on Biological Diversity and almost all of the Pacific nations are signatory to the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region.



**Links with the marine ecosystem**

A prominent environmental role of coastal forests such as mangroves and tidal forests is the production of leaf litter and detrital matter, which enters the marine food web. Mangroves are found in all but four (Cape Verde, Cyprus, Cook Islands and Malta) of the 41 SIDS and are highly productive ecosystems. Their importance as feeding ground, breeding and nursery grounds for numerous commercial fish and shellfish – including most commercial tropical shrimps – is well established. In addition, mangroves act as a sediment trap for upland run-off sediments, thus protecting sea grass beds, nearshore reefs and shipping lanes from siltation and reducing water turbidity

**Links with tourism**

Forest based tourism and recreation is on the increase. Whereas forests may rarely be the primary attraction for overseas visitors, they have a great potential, in some islands to complement dive sites and other primary attractions. The Forestry Departments in Dominica and St. Lucia, for instance, earn significant revenue from entrance fees for natural parks and access to renovated forest trails and in Mauritius, a mangrove forest was restored by a the owner of a hotel who uses this ecosystem to make guided walks and attract tourists and on the island of Dominica forest-based ecotourism is showing great potential.

In addition, coastal forests are critical in maintaining the health of coral reefs, which, in turn, protect beaches from sand erosion. Thus, in the Caribbean and some Pacific island states, they are an indirect but essential resource for maintaining and enhancing the appeal of tropical islands to the mainstream tourism industry.

These many and important roles of forests and trees in small islands call for a holistic and integrated approach to forest conservation and development taking into account not only the direct benefits obtainable from the forests but also the links with associated natural ecosystems and other economic sectors.

## **CONSTRAINTS AND OPPORTUNITIES FOR SUSTAINABLE FOREST MANAGEMENT IN SMALL ISLAND DEVELOPING STATES**

### **Constraints inhibiting sustainable forest management in SIDS**

Small island countries vary a great deal according to distinct geographic, biological, social, cultural, and economic characteristics but share many common disadvantages, which constrain their efforts to conserve and sustainably use their forest resources. These constraints include the following.

#### ***Limited land area and natural resources and high population pressure***

Relief, climatic variations and small size<sup>5</sup> of island countries limit the amount of land available for productive purposes and intensify competition among alternative land use options including land which must be protected (forested watersheds, national parks and protected areas). Population density is usually high and concentrated in lowland and coastal areas, which increases pressure on already limited resources in such areas. As a result, there are only limited options for diversification of economic activities in the forestry sector.

Due to the high population density in the Caribbean islands (with an average of 151 persons per km<sup>2</sup> compared to an average of 55 persons per km<sup>2</sup> in Central America), most of the land with a potential for agriculture was cleared of forest during the early decades of colonisation. The remaining forest is now concentrated in rugged and inaccessible areas, which reduces the potential to harvest and manage the forest for production purposes. In Dominica, for example, only 20 percent of the forest area can be used for productive forestry. The remainder is either too steep, inaccessible or is set aside for watershed protection or biodiversity conservation (FAO 1992).

#### ***Vulnerability to environmental disasters***

With few exceptions, these nations are susceptible to tropical storms, hurricanes, cyclones, storm surges, volcanic eruptions, earthquakes, forest fires and landslides<sup>6</sup>. Since damage often occurs on a national scale; a single disaster can cripple an island's infrastructure and economy. Like all land based systems in small islands and low-lying coastal areas, forests are threatened in the long term by rising sea levels associated with global climate change.

Several forest plantation projects in SIDS have been devastated by cyclones in the recent past. In January 1990 Samoa's plantation estate stood at 4 392 hectares. Cyclones Ofa and Val (along with stands which were written off due to poor establishment) destroyed 92 percent of this area. In September 1995 only 350 hectares of the original plantings remained (FAO 1997). And another example: "The management of all of the pine plantations [on Fiji] is dominated by uncertainty over their future growth due to the incidence of cyclones and a high fire hazard" (Ball 1993). Efforts at tree improvement have been severely hampered in Fiji due to damage caused to seed stands and research trials by cyclones (Ball 1993). Forest fires,

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<sup>5</sup> With the notable exceptions of the low-lying coastal States, Papua New Guinea and Cuba.

<sup>6</sup> The 1990 UN Disaster Relief Organization review of the economic impact of disasters over the past 20 years reports that of the 25 most disaster-prone countries, 13 are SIDS (UNDRO 1990).

caused by natural or man made events, can also be a serious constraint to sustainable forest development.

With regard to sea level rise caused by global warming, it is estimated that, by the end of the century, mean temperatures for the small islands regions may increase by around 3°C, resulting in an increase in global sea level of about 50cm by 2100, thus severely threatening islands and low-lying coastal states. Global warming is also likely to lead to an increase in maximum tropical cyclone wind speeds and lower central pressures, leading to more damaging storm surges. The combined effects of increases in cyclone intensities and sea-level rise are one of the major threats to the future well-being of small island countries. Model-based studies suggest that by 2080 the number of people flooded by these greater storm surges in any typical year will be more than five times higher than present. The islands of the Caribbean, the Indian and Pacific Oceans face the largest relative increase in flood risk, with the number of people at risk being some 200 times higher than in most other parts of the world. (Hay, 2000)

***High species endemism and high risk for loss of biological diversity***

A high degree of endemism, but relative small population size of the individual plant and animal species, imposes high risks of species extinction brought on by deforestation, unsustainable forestry and agricultural practices, unmanaged tourism and the introduction of exotic species. At the same time, the smallness of the area of many SIDS makes it difficult to set aside large areas for strict protection purposes. Of particular concern to production forestry is also the considerable erosion of forest genetic resources which has occurred in association with deforestation and forest degradation. A number of socio-economically important tree species, including more sought-after commercial timber species such as sandalwood (*Santalum* spp.), kauri pine *Agathis* spp. and rosewood (*Pterocarpus indicus*) and species used for traditional handicrafts such as *Cordia subcordata*, *Intsia bijuga* and *Thespesia populnea*, are, for instance, endangered in part or all of their natural range in the South Pacific (AUSAID 1997). There is thus a clear need to develop suitable strategies for conservation of biological diversity.

***Economic constraints due to smallness of scale and geographical isolation***

Not only are they small in total area, but many SIDS (particularly in the Pacific) consist of numerous smaller islands, often spread out over a large area and far away from nearby land masses and their markets. This results in high costs for public administration and infrastructure including transport and communications; small internal markets; limited export volumes, sometimes from remote locations and at irregular intervals due to the limited resource base, leading to high freight costs and reduced competitiveness and difficulties in establishing competitive forest processing industries. As a result, locally produced goods are often more expensive than imported ones - unless protection tariffs are imposed. Table 3 highlights the dependence on imported wood products by all but the largest SIDS.

***Institutional constraints***

Forests are not high on the list of priorities in most of the smaller SIDS and articulated up-to-date forest policies are rare, even when forest legislation is in place. Forest agencies, where they exist, often have limited financial and human resources, which compounded by the

effects of high levels of emigration of skilled people poses a major constraint. Forest-related activities are frequently supported by external assistance and only limited follow-up takes place when some of these projects come to an end. Inadequate information on the resource base makes it difficult to effectively address the issues at hand.

***Constraints caused by tenure systems***

In many small island states in the Pacific, land is generally under customary ownership (i.e. owned communally or by families rather than by the state or by individuals). Where land tenure is individual, the inheritance system either fragments physical parcels of land (e.g. Kiribati) or fragments ownership rights (e.g. Cook Islands and Nauru, where pieces of land too small to support a single family may have a hundred or more legal owners (Cocombe 1987)). Natural resource management thus involves many stakeholders and decision makers and presents a major challenge for wildlife conservation and sustainable forest management efforts. Insecure tenure, e.g. by those renting or illegally occupying cleared forest land in some of the Caribbean islands, and absentee land owners are major impediments to promotion of soil conservation measures, agroforestry systems and the establishment of private plantations (FAO, 2001b).

***Lack of integrated land use planning***

Limited natural resources, competition for land and adverse cross-sectoral impacts of different land uses call for integrated land use planning. However, only few SIDS have well defined land use plans.

***Lack of sustainable forest management practices***

Unsustainable forest management practices have, in some instances, led to the degradation of forest resources, soil erosion and siltation of downstream areas. Overexploitation of commercial timber resources is not uncommon and inappropriate harvesting practices are often employed. Forest industries are frequently running below capacity. Technical constraints to plantation development and tree planting programmes include the lack of access to seed of high genetic and physiological quality (AUSAID 1997).

***Long time frame needed***

The long time frame needed e.g. in plantation development, combined with the risk of natural calamities and possible changes in legal provisions (e.g. land tenure) can be a major disincentive to tree planting and sustainable forest management by private individuals.

## **Opportunities and future prospects**

### ***Forest product intensification***

The short-term prospects for an increase of wood production in natural forests are limited in most SIDS. Although many of the larger SIDS are well endowed with forests, not all forests are accessible and harvesting of commercial species is, in many places, already undertaken at unsustainable levels. In the medium- to long-term, such increases depend on the adoption of environmentally sound forest harvesting practices and the application of appropriate silvicultural practices - in many cases including enrichment planting of previously harvested areas. On a positive note, the countries in the Pacific have developed a regional "Code of Conduct for Logging of Indigenous Forests in Selected South Pacific Countries" which was endorsed by the 26th South Pacific Forum meeting in September 1995. At that time, only Fiji had developed its own national code of logging practice (launched in 1990 and fully implemented by 1996). PNG, Solomon Islands and Vanuatu have subsequently developed national codes based on the regional code, and are in various stages of implementing these.

An increase in wood production from plantations is possible in some of the larger SIDS. Fiji is an example of a country, which already has a well established plantation development programme and where plantation based timber production is planned to become a major growth sector in the national economy. However, the competition for limited land area, at times combined with customary ownership (see above), limits the potential for large-scale plantation establishment in many states. Lack of good soils is also a limiting factor in some SIDS - particularly those which are coral-based.

Agroforestry systems with coconut as the main wood resource seem to hold the most promising prospect as a sustainable land use system for atolls with low soil fertility as well as for smaller states, where availability of land is a limiting factor.

Where planting of trees is undertaken in areas prone to cyclones, species which exhibit good resistance to wind damage should be promoted. In the Pacific, these include *Intsia bijuga* and *Pometia pinnata*, which in Samoa suffered only minor damage from cyclone Ofa in 1991. Whitewood (*Endospermum medullosum*), kauri pine (*Agathis spp.*) and *Terminalia richii* are other examples of indigenous species in the South Pacific, which are well-adapted to withstand cyclone-force winds.

### ***Product diversification***

Value-added wood processing, in particular of local hardwoods, offers good prospects for diversification in those SIDS well endowed with forests. Good prospects also exist for diversification in terms of the provision of non-wood forest products, where niche markets are present or can be developed, and, in some cases, for bio-prospecting - taking advantage of the unique genetic resources found in many islands.

### ***Expansion of eco-tourism***

Tourism is currently one of the most important income earning industries in many SIDS endowed with tropical climate and sandy beaches, and interest in eco- or nature-based tourism is increasing<sup>7</sup>. Whereas the forests on these islands rarely are the primary attraction for overseas visitors, they may contribute to the tourism appeal. Various islands have already made special efforts to develop the tourist potential of their forest areas, among which are Pohnpei in the Federated States of Micronesia, Mauritius and the Seychelles, Dominica, Jamaica and St. Lucia.

### ***Enhancement of the protective roles of forests***

The short distance between highlands and coastal areas and the relatively limited size of watersheds combine to make soil and water conservation a priority. Special efforts may be needed in terms of reforestation of degraded watersheds and in most islands, planting in coastal areas is necessary to protect against coastal erosion and the effects of strong winds. Protection of mangrove areas, which are highly resistant to storm damage, is particularly important in this regard.

### ***Conservation and sustainable use of forest biological diversity***

Conservation of biological diversity is of economic importance both from a productive (forestry and agriculture) point of view and in support of nature based tourism activities. One solution to the tenure problem in the South Pacific has been the development of Wildlife Management Areas (WMA) in Papua New Guinea. These are established, at the request of local land owners to regulate hunting and protect the habitat of rare and important animals such as the Birds of Paradise. The Government provides legal recognition to WMA, but land ownership remains in the hand of local people. The WMA concept accommodates the particular conditions that prevail in many Pacific nations, and could perhaps be applied in neighbouring island states.

### ***Carbon credits***

Countries such as Belize, Fiji, and Papua New Guinea have already implemented projects aimed at offsetting carbon emissions through plantations and forest protection under the pilot phase of activities implemented jointly (AIJ) launched by the fifth meeting of the Conference of the Parties (COP 5) of the United Nations Framework Convention on Climate Change. Other countries like Solomon Islands and Vanuatu are also trying to integrate carbon offset components into forest management projects (FAO 1999).

### ***Regional collaboration***

Given the small size, limited human resources and physical isolation of SIDS, subregional collaboration is of great importance. Fortunately, a long tradition of inter-island trade and collaboration exists and a large number of international and regional organisations are found. Refer to the following chapter.

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<sup>7</sup> The World Tourism Organization reports that ecotourism activities have been expanding rapidly over the past two decades world-wide and forecasts further growth in the future (WTO/UNEP 2002).

## FORESTRY RELATED ORGANISATIONS AND INITIATIVES

### International organisations and initiatives

#### *The Alliance of Small Island States (AOSIS) and the Barbados Programme of Action*

The Alliance of Small Island States, which was established in 1991, is a grouping within G77 composed of 35 independent island nations and four low lying coastal states, with four dependent territories as observers. Following UNCED, a Global Conference on the Sustainable Development of Small Island Developing States was held in Barbados in April 1994, resulting in the Barbados Programme of Action for the Sustainable Development of Small Island Developing States. Commitments have been made to provide special assistance to these states, particularly within the framework of the Barbados Programme, but also as a result of several other international and regional events which have taken place within the last few years. A comprehensive review of the implementation of the Barbados Programme was presented at a UN General Assembly Special Session in 1999, where a series of proposed initiatives for the further implementation of the Programme. See <http://www.sidsnet.org/aosis/> for details.

#### *FAO and its plan of action on agriculture in SIDS*

Thirty-five small island developing states and four low-lying coastal states are member of the FAO and several small islands which are dependent territories are indirect members. Noting that the Barbados Programme of Action included limited reference to specific activities related to agriculture forestry and fisheries, FAO held a Ministerial Conference on Agriculture in Small Island Developing States in 1999. A Plan of Action for ensuring sustainable management of land, water and forestry resources and environmental protection of SIDS was formulated within the framework of the World Food Summit follow-up and was adopted by the FAO Council in June 1999.

The Plan comprises the following five main areas of actions:

- (i) Adjusting to changes in the global trading environment
- (ii) Towards a more intensified, diversified and sustainable agriculture
- (iii) Meeting fisheries needs
- (iv) Ensuring sustainable management of land, water and forestry resources and environmental protection
- (v) Capacity building and institutional strengthening

The Plan proposes a number of activities aimed at promoting the sustainable management of forest resources; enhancing the protective roles of forests; strengthening national forest agencies; and providing a coherent and supportive legal framework and an integrated approach to natural resources management. Refer to Annex 2 for details.

For more information on FAO's activities related to Small Island Developing States refer to <http://www.fao.org/sids/> and <http://www.fao.org/forestry/sids/>

***The Small Island Developing States Network (SIDSnet)***

Small Island Developing States Network (SIDSnet) is a direct follow-up to the 1994 Barbados Programme of Action (BPoA). SIDSnet connects 43 Small Island Developing States (SIDS) in the Pacific, Caribbean, Atlantic, Indian Ocean, Mediterranean and African island nations. SIDSnet's main goal has been to utilise information and communication technologies (ICTs) to link SIDS in supporting the implementation of the sustainable development objectives of the BPoA. The project was launched in 1998 through UNDP's Sustainable Development Networking Programme (SDNP) and the Alliance of Small Island States (AOSIS). The Water Resources Management and Small Island Developing States Branch of the United Nations Department of Economic and Social Affairs (DESA) currently administer the project.

See <http://www.sidsnet.org> for details.

***United Nations Commission for Sustainable Development***

The Commission for Sustainable Development (CSD) was created to ensure follow-up of the United Nations Conference on Environment and Development (UNCED). Through the adoption of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States, the commission set forth specific policies, actions and measures to be taken at the national, regional and international levels in support of the sustainable development of SIDS.

See <http://www.un.org/esa/sustdev/sids.htm> for details

***UNEP***

The United Nations Environment Programme (UNEP) website provides access to information on SIDS, including that from within the UN system. Information consists of an introduction to SIDS as well as environmental outlook reports, vulnerability indices developed for SIDS, United Nations documents on islands (including Agenda 21, the Commission on Sustainable Development and the Barbados Conference) as well as other island documents. The site also contains an island directory consisting of a compilation of geographic, environmental, and socio-economic information on 2,000 islands and over 150 countries, territories and administrative units with islands.

See <http://www.unep.ch/islands.html> for details.

***UNESCO***

The United Nations Educational, Scientific and Cultural Organization (UNESCO) stages a global platform for intersectoral action for development in small island states, the Coast and Small Islands (CSI) platform. The platform consists of field projects, UNESCO Chairs and University Twinning arrangements as well as a multi-lingual, internet-based forum on 'Wise Coastal Practices for Sustainable Human Development.

See <http://www.unesco.org/csi/> for details.



## **Regional organisations and initiatives in the Pacific**

### ***Pacific Islands Forum (formerly the South Pacific Forum)***

The most important regional organisation in the South Pacific is the Pacific Islands Forum, which represents Heads of Governments of all independent and self-governing Pacific Island countries, Australia and New Zealand. Its mission is to work in support of Forum Member governments to enhance the economic and social well-being of the people of the South Pacific by fostering cooperation between governments and between international agencies, and by representing the interests of Forum members in ways agreed by the Forum. Forestry issues, especially the exploitation of tropical forests, have been highlighted at recent meetings. At the Twenty-fifth Session in 1994 an agreement to draft a Code of Conduct for logging in the South Pacific was reached. The Code sets minimum standards, which will allow selected forests to be harvested with the minimum of adverse impacts. The Code has been ratified by Papua New Guinea, Solomon Islands, Fiji and Vanuatu.

See <http://www.forumsec.org.fj/> for details.

### ***The Secretariat of the Pacific Community (SPC)***

The Secretariat of the Pacific Community (SPC) provides technical advice, assistance and training, and applied research to its Island member countries and territories throughout the Pacific region for the purpose of regional and technical development. The SPC conducts a number of activities including forestry programmes, crop improvement, plant protection, coastal fisheries programmes, as well as social programmes such as public health surveillance.

See <http://www.spc.org.nc/> for details.

### ***South Pacific Regional Environment Programme (SPREP)***

Environmental issues in the South Pacific are generally handled under the South Pacific Regional Environment Programme established in 1982 as a result of an increasing number of environmental problems being raised at the South Pacific Forum. SPREP's members total 26, consisting of all 22 Pacific island countries and territories, and four developed countries with direct interests in the region: Australia, France, New Zealand and the United States of America. A major regional forestry programme is the Pacific Islands Forests and Trees Support Programme, which provides institutional, training, and network support to the countries of the South Pacific.

See <http://www.sprep.org.ws/> for details.

### ***SPRIG***

South Pacific Regional Initiative on Forest Genetic Resources is a project funded by the Australian Agency for International Development and covering Fiji, Tonga, Vanuatu, Samoa and Solomons Islands. In Phase 1 of SPRIG (1996-2000) species conservation strategies were developed for 10 priority species. Phase II of SPRIG is currently in progress (2001-2006) and

has been designed to address the problems and the potentials for forest and tree genetic resources and associated farming and forest ecosystems.

See <http://www.ffp.csiro.au/tigr/atscmain/whatwedo/projects/sprig/index.htm> for details.

## **Regional organisations and initiatives in the Indian Ocean**

### ***Indian Ocean Commission***

The main organisation of the Indian OCEAN SIDS is the Indian Ocean Commission officially known by its French title: Commission de l'Océan Indien (COI)

The COI is an original organisation linking four ACP states (and the 3 SIDS) - Seychelles, Mauritius, Comoros and Madagascar - and an "ultra peripheral" European region, Reunion. COI was created in 1984 by the General Cooperation agreement of Victoria. The General Agreements describes the cooperation areas as follows:

- Diplomatic co-operation ;
- Economic and commercial co-operation;
- Co-operation in agriculture, marine fisheries, and conservation of resources and ecosystems ;
- Co-operation in the areas of culture, science, technology, education and justice.

To finance its projects, the COI receives an important assistance from the European Union which intervenes in the context of the guidelines of the Lomé Convention , known now as the Cotonou Agreements, via the European Development Fund. The Chief Foresters of the COI countries meet regularly to foster collaboration in their sector.

See <http://www.coi-info.org/> for details

## **Regional organisations and initiatives in the Caribbean**

### ***CARICOM***

The Caribbean Community and Common Market (CARICOM) works for the economic integration of the member countries through the common market; co-ordination of the foreign policies of member states; and functional co-operation, especially in areas of social and human endeavour. The Agricultural Development Unit handles forestry issues of regional character.

See <http://www.caricom.org/> for details.

### ***The Caribbean Natural Resources Institute (CANARI)***

The Caribbean Natural Resources Institute (CANARI) is an independent regional technical body, which researches and promotes participatory natural resource management in the Caribbean. CANARI actively encourages and supports local, national, and regional initiatives

that foster stakeholder participation in resource management, in particular through technical assistance. The programme involves three main elements - research, analysis and advocacy on the methods and institutions required for participatory management. Through its training activities and technical assistance the Institute has established an informal network in support of participatory forest management. The Institute also complements existing networking mechanisms (e.g. by providing inputs to the Caribbean Foresters Meeting).

See <http://www.canari.org/> for details.

#### ***Eastern Caribbean Institute for Agriculture and Forestry (ECIAF)***

As well as providing a first qualification in forestry, the Eastern Caribbean Institute for Agriculture and Forestry (ECIAF) people together in a learning environment, which has engendered a kinship among many of the region's professional foresters. Graduates from the Institute become part of a loose, informal and uncoordinated network that is extremely effective in facilitating the exchange of information and sharing of experiences.

See <http://www.uwichill.edu.bb/tliu/cc/eciaf.htm> for details.

#### ***International Institute for Tropical Forestry (IITF)***

The IITF is a scientific institute dedicated to tropical forestry, created in 1939 Río Piedras, Puerto Rico and under the administration of the US Department of Agriculture - Forest Service. Among other activities, the IITF coordinates the ***Caribbean Foresters Meeting***, which takes place every two years which aims to provide an opportunity for exchanges for foresters from administrations across the region. At these themed meetings delegates are invited to give country reports in the context of the issue being focussed on. Specialists are invited to make presentations and these are complemented with field visits. In addition to providing a focus for networking the meetings are valued as one of the few opportunities for the continuous professional development of the region's foresters.

See <http://www.fs.fed.us/global/iitf/welcome.html> for details

#### ***Latin American and Caribbean Forestry Commission (L AFC)***

Within the FAO Latin American and Caribbean Forestry Commission (L AFC)<sup>8</sup> the Caribbean sub-group meets regularly to identify the capacity needs of forestry administrations and plan activities to meet these. Over the past two years a range of workshops and consultations have resulted from the sub-group's decisions, which have addressed general issues (e.g. forestry education and training in the Caribbean) as well as specifics (e.g. promoting forestry activities on private land). The sub-group is diverse and in 2000 took the decision to foster collaboration and cooperation in three smaller working groups (Caribbean continental countries; Francophone and Spanish-speaking island states; and Anglophone islands).

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<sup>8</sup> The Latin American and Caribbean Forestry Commission is one of six regional forestry commissions of the Food and Agriculture Organization (FAO). Established by the FAO Conference in 1948, it provides a policy and technical forum for the countries of the Latin American and Caribbean region to discuss and address forest issues on a regional basis. Drawing on regional experiences, it also provides advice to the FAO forestry programme.

## **MEDIUM TERM OUTLOOK FOR THE FORESTRY SECTOR**

The Melanesian SIDS (Papua New Guinea, Solomon Islands, Fiji and Vanuatu) are all relatively well endowed with significant land area, fertile soils and natural resources. Their export bases are, however, narrow. The medium- to long-term forestry prospects will rely on the adoption of sustainable forest management practices in the natural forests; the establishment of plantations and the further development of appropriate wood processing industries (FAO, 1997).

The SIDS of Polynesia and Micronesia are generally less well endowed with resources. Those which are of volcanic origin, (e.g. Samoa and Tonga) have rich soils and agriculture and/or forestry provide development options. Samoa is presently the only Polynesian country with a timber export industry. However, most of the smaller islands are coral-based and have very poor soils, small land areas and few land-based natural resources. Tourism, fisheries, foreign aid and expatriate remittances are likely to be the main income earning possibilities in these islands. Agroforestry systems with coconut as the main timber resource seem to hold the most promising prospect as a sustainable land use system for these islands (FAO 1997).

In the East African SIDS, an important focus is the conservation and restoration of forests. This is essential to maintain or improve habitats, to protect watersheds and to contribute to the important tourism industry, which uses the forests for recreation. The countries use selected indigenous trees for timber but will continue importing most of their wood from nearby countries (Madagascar, Mozambique and Tanzania). In the Seychelles, the 3 main priorities are thus listed as: environmental conservation and maintenance of the biodiversity in order to continue to attract tourists; conservation of soil and water resources; and the development of small-scale wood and non-wood forest industries (Vielle 2001). In Mauritius, it is expected that about 8 000 ha of forest lands will be lost in the next two decades due to population growth and the need for additional agricultural land. This will have a significant effect on the production of pink pepper (*Schinus terebentifolia*) which is likely to decline from 50 to 25 tonnes per year. Conversely, demand for fuel wood is expected to fall and concerted efforts may bring back a substantial number of highly endangered species from the brink of extinction. The demand for wood products is expected to be met from plantations and imports. (Paupiah 2001).

In the Caribbean, the general trends include a slow but progressive move towards a more sustainable management of forests, an increase in the reliance on plantations for commercial timber harvesting although most islands will remain dependent on imports of forest products, intensification of watershed management and protection, continued development of conservation strategies, increased recognition of ecotourism, bio-prospecting and carbon credit trading as alternative forest income and continued and increased community involvement in forest management (FAO 2000b).

In many of the islands, the main focus is expected to continue to be on tourism, the safeguarding of freshwater supply and conservation of biological diversity. Nevertheless, production of wood and non-wood forest products could play an increasingly important role in import substitution as land use for commercial agriculture is expected to decrease in some of the islands and such lands become available for plantation establishment or revert to forest through natural regeneration (FAO 2000b). Such natural expansion of forests can already be witnessed in Barbados, Dominica, Grenada, St Vincent and the Grenadines, St Kitts and Nevis.

The lowland forests of Belize, Guyana and Suriname are of a great economic potential, but the timber and other forest resources are heavily under-priced and an inadequate contribution is currently received from their utilization. All countries are expected to change their forest management progressively aiming at sustainable forest management and the enhanced provision of social and environmental services provided by forests. (FAO 2000b). Given the current trends in national development priorities, it is expected that the forest cover of Belize will decrease. However, the growing stock could be in a better condition in terms of species composition and biomass if the trend to intensify forest management in key areas is maintained and the wood production level may only decrease in the short term and could reach a sustained level in fifteen to twenty years. More direct involvement of local community-based and non-governmental organisations in forest management is also expected. (Forest Department, MNREI 2000). In Guyana, the 3 main priorities for the medium term are: an increase in the economic benefits derived from forests; improved sustainability of the forest-based sector and better sharing of the benefits of forest-based development (Forestry Commission 2000).

## **CONCLUSION**

As a group, Small Island Developing States are relatively well endowed with forests, but large variations exist between islands. While the combined forest cover of these islands is insignificant in global terms, forests and trees are extremely important for the well-being of the local inhabitants in terms of their contribution to food security and income, water conservation and coastal protection. For most of the larger islands, forests also contribute significantly to the national economy and to international trade in wood and non-wood forest products. In addition, the forests on several islands are of global importance in terms of their role in the conservation of biological diversity, in particular endemic species and genetic variability. These many and important roles of forests and trees call for a holistic and integrated approach to forest conservation and development taking into account not only the direct benefits obtainable from the forests but also the links with associated natural ecosystems and other economic sectors.

Although Small Island Developing States are spread around the globe and differ to a very large extent in terms of geographic, biological, social, cultural, and economic characteristics, they share many common constraints but also several unique opportunities for the conservation and sustainable use of their forest resources. The extent to which they will be able to overcome the constraints and capitalise on the opportunities depends on political will, regional collaboration and international support - not least in terms of the development and implementation of disaster reduction strategies and assistance when environmental disasters do strike.

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## ANNEX 1: INTERNATIONAL CONVENTIONS AND AGREEMENTS

### Status of ratification of international conventions and agreements

<i>COUNTRY</i>	Convention on Biological Diversity	UNFCCC	Kyoto Protocol (of the UNFCCC)	Convention to Combat Desertification	CITES	Ramsar Convention	World Heritage Convention	International Tropical Timber Agreement 1994 (ITTO Members)
<b>AFRICA:</b>								
Cape Verde	Rtf	R		R			Ac	
Comoros	Rtf	R		R	A	X	R	
Guinea-Bissau	Rtf	R		R	A	X		
Mauritius	Rtf	R	Ac	R	R	X	R	
Sao Tome and Principe	Acs	R		R	A			
Seychelles	Rtf	R	R	R	A		Ac	
<b>ASIA:</b>								
Bahrain	Rtf	R		Ac		X	R	
Cyprus	Rtf	R	Ac	Ac	R	X	Ac	
Maldives	Rtf	R	R	Ac			Ac	
Singapore	Rtf	R		Ac	A			
<b>OCEANIA:</b>								
Cook Islands	Rtf	R	R	Ac				
Fiji	Rtf	R	R	Ac	A		R	X
Kiribati	Acs	R	Ac	Ac			Ac	
Marshall Islands	Rtf	R	S	Ac			Ac	
Federated States of Micronesia	Rtf	R	R	R			Ac	
Nauru	Rtf	R	R	Ac				
Niue	Acs	Ac	R	Ac			Ac	
Palau	Acs	R	Ac	Ac			Ac	
Papua New Guinea	Rtf	R	R	Ac	A	X	Ac	X
Samoa	Rtf	R	R	Ac			Ac	
Solomon Islands	Rtf	R	S	Ac			A	
Tonga	Acs	Ac		Ac				
Tuvalu		R	R	Ac				
Vanuatu	Rtf	R	Ac	R	A			X
<b>EUROPE</b>								
Malta	Rtf	R	R	R	A	X	Ac	
<b>NORTH and CENTRAL AMERICA</b>								
Antigua and Barbuda	Rtf	R	R	R	A		Ac	
Bahamas	Rtf	R	Ac	Ac	A	X		
Barbados	Rtf	R	Ac	Ac	A			

<i>COUNTRY</i>	Convention on Biological Diversity	UNFCCC	Kyoto Protocol (of the UNFCCC)	Convention to Combat Desertification	CITES	Ramsar Convention	World Heritage Convention	International Tropical Timber Agreement 1994 (ITT0 Members)
Belize	Rtf	R		Ac	D	X	Ac	
Cuba	Rtf	R	R	R	A	X	R	
Dominica	Rtf	Ac		Ac	A		R	
Dominican Republic	Rtf	R	Ac	Ac	A	X	R	
Grenada	Rtf	R	Ac	Ac	A		Ac	
Haiti	Rtf	R		R			R	
Jamaica	Rtf	R	Ac	Ac	A	X	Ac	
Saint Kitts and Nevis	Rtf	R		Ac	A		Ac	
Saint Lucia	Acs	R	S	Ac	A	X	R	
Saint Vincent and Grenadines	Acs	Ac	S	R	A			
Trinidad and Tobago	Rtf	R	R	Ac	A	X		X
<b>SOUTH AMERICA:</b>								
Guyana	Rtf	R		Ac	A		Ac	X
Suriname	Rtf	R		Ac	A	X	Ac	X

Note: the regional breakdown reflects geographic rather than economic or political groupings.

#### ABBREVIATIONS USED AS PER EACH CONVENTION/AGREEMENT

##### Convention on Biological Diversity (as of 20 Aug 2002)

Rtf = Ratification  
Acs = Accession

##### Framework on Climate Change Convention (FCCC) (as of Oct 2002)

R = Ratification  
Ac = Accession

##### Kyoto Protocol (as of 16 Oct 2002)

R = Ratification  
At = Acceptance  
Ap = Approval  
Ac = Accession

##### Convention to Combat Desertification (as of 11 Oct 2000)

R = Ratification  
At = Acceptance  
Ac = Accession

**Convention on International Trade in Endangered Species of Wild Fauna and Flora  
(CITES) (as of Oct 2002)**

R = Ratification  
A = Accession  
Ac = Acceptance  
Ap = Approval  
C = Continuation  
D = Declaration of Succession

**World Heritage Convention (as of 28 Sept 2002)**

R = Ratification  
Ac = Accession

**Ramsar Convention (as of 1 Nov 2002)**

**International Tropical Timber Agreement (as of Oct 2002)**

## ANNEX 2 : FAO'S PLAN OF ACTION ON AGRICULTURE IN SIDS

Thirty-five small island developing states and four low-lying coastal states are member of the FAO and several small islands are dependent territories are indirect members. Noting that the Barbados Programme of Action included limited reference to specific activities related to agriculture forestry and fisheries, FAO held a Ministerial Conference on Agriculture in Small Island Developing States in 1999. A Plan of Action for ensuring sustainable management of land, water and forestry resources and environmental protection of SIDS was formulated within the framework of the World Food Summit follow-up and was adopted by the FAO Council in June 1999.

The Plan comprises the following five main areas of actions:

- (i) Adjusting to changes in the global trading environment
- (ii) Towards a more intensified, diversified and sustainable agriculture
- (iii) Meeting fisheries needs
- (iv) Ensuring sustainable management of land, water and forestry resources and environmental protection
- (v) Capacity building and institutional strengthening.

The main forestry-related objectives and activities of the proposed plan of action are presented below.

*Objective 4.1:* To promote the conservation and sustainable use of land and water resources and manage sustainably the forest resources

- a) Promote the adoption and implementation of a land and water use planning approach, which take into consideration the linkages and interactions between the various ecosystems and economic sectors.
- b) Pursue a holistic and integrated approach to the conservation and sustainable use of forest resources taking into account the multiple roles of forests and trees.
- c) Promote rehabilitation and conservation of forestlands and watersheds and, where necessary and sustainable, upgrade the productive capacity of these resources and ensure sustainable forest management and sound harvesting practices.
- d) Combat land degradation and enhance coastal protection through, inter alia, intensified soil conservation, afforestation and reforestation activities.
- e) Promote agroforestry systems and the development of multipurpose tree species which are resistant to pest, diseases and cyclones.
- f) Pursue integrated planning of both terrestrial and marine environments to prevent their degradation and to soundly utilize the full potential of the natural resource base, particularly for eco-tourism.

*Objective 4. 2:* To enhance the environmental protection.

- a) Strengthen the information basis for environmental monitoring and integrate environmental values and concerns into the development process.
- c) Develop new or amend existing national legislation, as appropriate, to ensure that a comprehensive, updated and coordinated legal framework on natural resource management and environmental protection is in place.

- d) Enforce, ratify or conclude, as appropriate, international conventions, such as the UN Convention to Combat Desertification, the Convention on Biological Diversity and the UN Framework Convention on Climate Change and the Kyoto Protocol; if required, adopt national legislation to implement these conventions and promote collaboration mechanisms for their implementation.

*Objective 4.3: To improve disaster preparedness*

- a) Minimize the vulnerability to and impact of natural hazards, climate fluctuations, forest fires, pests and diseases through the formulation of disaster preparedness and mitigation strategies.
- c) Undertake efforts to protect mangrove areas which provide protection against tidal surges and to storm damage.

*Objective 5.1: To develop and/or strengthen national capacities in the context of the Uruguay Round Agreement on Agriculture.*

- b) Build up national policy formulation capacity in agricultural, forestry, and fisheries sectors and adequate analytical capacity to assess the impact of policy changes being proposed at WTO.

*Objective 5.2: To strengthen the supporting services to agriculture.*

- b) Improve the availability and accessibility of credit which is critical to promoting non-traditional commodities.
- c) Establish joint marketing services with strong private sector participation.
- e) Strengthen national forest agencies and improve coordination among national forestry and related agencies in their work and in relation to foreign funded assistance programmes.

*Objective 5.3: To provide a coherent framework for sustainable natural resource management and environmental protection.*

- a) Provide, strengthen and ensure implementation of appropriate legislation on environmental protection and natural resource management, including land, water and forest resources, plant protection and animal health, climate change, desertification, biodiversity, wildlife and genetic resources, protected areas and critical habitats, integrated coastal area management [...].
- b) Promote integrated approaches to natural resources management, in order to mitigate adverse inter-sectoral impacts [...]
- c) Integrate national forest policies into a larger natural resources management framework at national level.
- d) Discourage unsustainable agricultural practices, uncontrolled deforestation, destructive fishing practices and overfishing.
- e) Elaborate measures to mitigate biodiversity losses, making full use of local knowledge very often retained by women.
- f) Establish, as appropriate, relevant databases, information systems and support regional collaboration, including inter-island information and technology sharing.